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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/762,220	03/23/2001	Hideharu Takezawa	10059-371US	2883

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EXAMINER	
TSANG FOSTER, SUSY N	12
ART UNIT	**PAPER NUMBER**
1745	

DATE MAILED: 10/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

12 KB

Office Action Summary	Application No.	Applicant(s)	
	09/762,220	TAKEZAWA ET AL.	
	Examiner	Art Unit	
	Susy N Tsang-Foster	1745	

-- The MAILING DATE of this communication app ars on the cover she t with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 August 2003 and 29 September 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *17-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *17-23 and 26* is/are allowed.

6)☒ Claim(s) *24,25 and 27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *12* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Response to Amendment

1. This Office Action is responsive to the amendment filed on 8/18/2003. Claims 1-16 have been cancelled and claims 17-27 have been added. Claims 17-23, and 26 are allowed for reasons given in the previous office action. Newly added claims 24, 25, and 27 are finally rejected for reasons necessitated by applicant's amendment.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 25 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 25 recites the limitation "the at least one phosphate" in line 2. There is insufficient antecedent basis for this limitation in the claim.

For the purposes of prosecution, claim 25 is interpreted as being depending from claim 24.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 24 and 27 are rejected under 35 U.S.C. 102(e) as being anticipated by Gan et al. (US 6,203,942 B1).

Gan et al. disclose a nonaqueous secondary battery comprising a chargeable and dischargeable positive electrode, a non-aqueous electrolyte containing lithium salt, and a chargeable and dischargeable negative electrode (col. 3, lines 34-59; col. 4, lines 11-19; col. 7, lines 10-32). A phosphate additive is added to the electrolyte having the general formula $(R^1O)P(=O)(OR^2)\ (OR^3)$ wherein **R^1, R^2, and R^3 are the same or different**, and they can be a ***hydrogen atom, or a saturated or unsaturated organic group containing 1 to 13 carbon atoms***. Specific examples of the phosphates are tribenzyl phosphate, dimethyl benzyl phosphate, diethyl benzyl phosphate, dipropyl benzyl phosphate, dibutyl benzyl phosphate, dimethyl phosphate, diethyl phosphate, dipropyl phosphate, dibutyl phosphate, diphenyl phosphate, dibenzyl phosphate, monomethyl phosphate, monoethyl phosphate, monopropyl phosphate, monobutyl phosphate, monophenyl phosphate, monobenzyl phosphate, and **mixtures thereof** are used as additives in the electrolyte (col. 5, line 54 to col. 6, line 10).

The positive electrode can comprise metallic lithium and a carbon material (col. 3, lines 35-45) and the negative electrode can comprise $LiCoO_2$, $LiMn_2O_4$, and $LiNiO_2$ (col. 4, lines 11-18).

It is noted that since the positive and negative electrode inside the battery is immersed and soaked in the electrolyte containing the phosphate additive, the positive and negative electrode will also contain the phosphate additive (col. 7, lines 10-31).

Gan et al. also disclose a method of producing the nonaqueous electrolyte secondary battery comprising the steps of:

preparing an electrode material comprising an active material, a conductive agent, and a binder and applying the electrode material on a current collector plate (foil) to prepare an electrode (col. 7, lines 17-22); assembling a nonaqueous electrolyte secondary battery using the electrode and a nonaqueous electrolyte where dibenzyl phosphate additive is dissolved in the electrolyte (col. 7, lines 22-31). As stated above, once the cell is activated with the electrolyte having the dissolved phosphate additive, the electrodes which are immersed in the electrolyte would contain the phosphate additive.

6. Claim 25 is rejected under 35 U.S.C. 102(e) as being anticipated by Gan et al. (US 6,203,942 B1) and as evidenced by Electrolyte Datasheet [online]. BEIJING PHYLION BATTERY CO. LTD.[retrieved on 2003- 05-21]. Retrieved from the Internet: <URL: www.fangxiang.com.cn/doce/cpjs_4.htm>.

Gan et al. disclose all the limitations for claim 25 except explicitly stating that the nonaqueous electrolyte contains 0.1 to 20 weight percent of at least one of the phosphate selected from the group consisting of dipentyl phosphate, dihexyl phosphate, diheptyl phosphate, dioctyl phosphate, dinonyl phosphate, didecyl phosphate, diundecyl phosphate, didodecyl phosphate,

monopentyl phosphate, monohexyl phosphate, monoheptyl phosphate, monooctyl phosphate, mononononyl phosphate, monodecyl phosphate, monundecyl phosphate, and monododecyl phosphate. In a specific example, 0.05 M dibenzyl phosphate (DBP) which has one hydroxyl group is added to the electrolyte containing EC:DMC:EMC:DEC in a 45:22:24.8:8.2 volume ratio and 1.0 M $LiPF_6$ (col. 2, lines 52-56 and col. 7, line 28-31). Gan et al. also disclose that the concentration of the phosphate additive in the electrolyte is preferably about 0.001 M to about 0.40 M (col. 10, lines 48-49). Diheptyl phosphate implicitly disclosed as discussed above and having a molecular weight of 294 g/mol can be equivalently used instead of the dibenzyl phosphate. Calculations indicate that an electrolyte solution containing 0.05 M diheptyl phosphate contains approximately 1 weight percent of the diheptyl phosphate which anticipates applicant's claimed range of 0.1 to 20 weight percent. The molecular weight for $LiPF_6$ is 152 g/mol. The densities for EC, DMC, EMC, and DEC used in the calculations are obtained from the electrolyte data sheet from the BEIJING PHYLION BATTERY CO. LTD. website having values of 1.41 g/cm^3, 1.07 g/cm^3, 1.00 g/cm^3 and 0.972 g/cm^3 respectively.

Response to Arguments

7. Applicant's arguments filed 8/18/2003 have been fully considered but they are not persuasive.

With respect to applicant's assertions that the Gan reference (US 6,203,942 B1) does not teach with specificity a nonaqueous electrolyte secondary battery including at least one of a positive electrode, a non-aqueous electrolyte, and a negative electrode that contains at least one phosphate that is selected from the group consisting of dipentyl phosphate, dihexyl phosphate,

diheptyl phosphate, dioctyl phosphate, dinonyl phosphate, didecyl phosphate, diundecyl phosphate, didodecyl phosphate, monopentyl phosphate, monohexyl phosphate, monoheptyl phosphate, monooctyl phosphate, monononyl phosphate, monodecyl phosphate, monundecyl phosphate, and monododecyl phosphate, the Examiner respectfully disagrees because Gan discloses that the organic phosphate additive is preferably a mono-ester or a diester (col. 5, lines 54-56) having the general formula cited in the reference which leads to one of the R groups being a hydrogen atom when the additive is a diester and two of the R groups being a hydrogen atom when the additive is a mono-ester.

As mentioned in the previous office action and reiterated herein, the phosphate additive of Gan added to the electrolyte has the general formula $(R^1O)P(=O)(OR^2)(OR^3)$ wherein **R^1, R^2, and R^3 are the same or different**, and they can be a **hydrogen atom, or a saturated or unsaturated organic group containing 1 to 13 carbon atoms**. Specific examples of the phosphates in the Gan reference include dimethyl phosphate, diethyl phosphate, dipropyl phosphate, dibutyl phosphate, monomethyl phosphate, monoethyl phosphate, monopropyl phosphate, monobutyl phosphate and **mixtures thereof** are used as additives in the electrolyte (col. 5, line 54 to col. 6, line 10).

Gan has given specific examples of a diester for two of the R groups to be the same and each containing 1 to 4 carbon atoms exemplified by dimethyl phosphate, diethyl phosphate, dipropyl phosphate, and dibutyl phosphate. Gan has disclosed that the each of the R groups can be the same and each can be a saturate organic group containing 1 to 13 carbon atoms. Following a logical progression of the diester examples explicitly given in the reference and

relying on the statement that R can each be the same and can be a saturated organic group containing 1 to 13 carbon atoms, it is reasonable to expect that Gan has implictly disclosed a diester additive where both R groups are the same and each contain 5-12 carbon alkyl groups to encompass dipentyl phosphate, dihexyl phosphate, diheptyl phosphate, dioctyl phosphate, dinonyl phosphate, didecyl phosphate, diundecyl phosphate, and didodecyl phosphate.

Similarly, Gan discloses that the phosphate additive can be a monoester which implies that only one R group has to be a non-hydrogen atom and the other two R groups must each be a hydrogen atom. When only one R group is required to be a non-hydrogen atom, R is disclosed as being **a saturated or unsaturated organic group containing 1 to 13 carbon atoms**. Following a logical progression of the specific monoester examples given in the reference and relying on the statement that R can each be the same and can be a saturated organic group containing 1 to 13 carbon atoms, it is reasonable to expect that Gan has implicitly disclosed a monoester additive having only one R group containing 5-12 carbon alkyl groups to encompass monopentyl phosphate, monohexyl phosphate, monoheptyl phosphate, monooctyl phosphate, monononyl phosphate, monodecyl phosphate, monundecyl phosphate, and monododecyl phosphate.

Finally Gan states that the explicitly disclosed examples are only intended to be exemplary and phosphate compounds which come under the purview of the general formula set forth in the reference would be useful as additives for the electrolyte (see col. 6, lines 10-18).

Allowable Subject Matter

8. Claims 17-23, and 26 are allowed.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications should be directed to examiner Susy Tsang-Foster, Ph.D. whose telephone number is (703) 305-0588. The examiner can normally be reached on Monday through Friday from 9:30 AM to 7:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at (703) 308-2383. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

st/ Susy Tsang-Foster

Susy Tsang-Foster
Primary Examiner
Art Unit 1745